IN THE UNITED STATES PATENT & TRADEMARK OFFICE

Application No.	10/707,592
Filing Date:	12/23/2003
Inventor (first named)	Robert Brule
Group Art Unit:	1775
Examiner Name:	Baldwin, Gordon
Attorney Docket Number:	53797.17

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Eileen Lucas

Eileen Lucas

DATED: July 21, 2006

RESPONSE TO OFFICE ACTION DATED MARCH 9, 2006

To: Assistant Commissioner for Patents
Alexandria, VA 22313-1450

Sir:

Please accept this letter as a response to office action dated March 9, 2006. Enclosed is a two month extension of time, which will extend the time for response to August 9, 2006.

ELECTION OF CLAIMS

The Examiner has required an election between Group I (claims 1-10) or Group II (claims 11-23).

The applicant confirms the provisional election of Group I (claims 1-10) made during a telephone conversation with Edward Yoo on February 13, 2006.

The applicant also confirms that Group II (claims 11-23) are cancelled without prejudice to his right to pursue similar or identical claims in a continuing application.

AMENDMENT OF CLAIMS

1. (Presently Amended) A high temperature gas seal, ~~in its pre-fired state, comprising ceramic fibres, ceramic powder, and a binder,~~ wherein the seal is unsintered and has a porosity less then 50% and which~~, in its fired state, has a higher porosity and~~ is substantially free of binder; said seal formed from firing an unfired state comprising ceramic fibres, ceramic powder and a binder and having a porosity which increases upon firing.

2. (Original) The seal of claim 1 for use in a high temperature fuel cell.

3. (Original) The seal of claim 2 wherein the ceramic fibres and ceramic powder may be the same material or different and may comprise alumina or zirconia.

4. (Original) The seal of claim 3 wherein the seal has a pre-fitted porosity of less then about 45%

5. (Original) The seal of claim 4 wherein the seal has a pre-fitted porosity of less then about 40%.

6. (Original) The seal of claim 5 wherein the seal has a pre-fitted porosity of less then about 35%.

7. (Original) The seal of claim 1 to 6, which is formed by a tape casting process.

8. (Original) The seal of claim 7 which has a fired porosity of less then about 50%.

9. (Original) The seal of claim 8 which has a fired porosity of less then about 45%.

10. (Original) The seal of claim 9 which has a fired porosity of less then about 40%.

REMARKS

1. The Examiner has rejected claims 1-10 under 35 U.S.C. 112 second paragraph, as being indefinite as claim 1 attempts to claim two different products or an intermediate and final product.

The Applicant has amended claim 1 to a product by process claim in which only the final product is claimed. Therefore, Applicant respectfully submits that claim 1 as amended, and claims 2-10 which depend on claim 1, are definite as required by 35 U.S.C. 112 second paragraph.

2. The Examiner has rejected claims 1-10 under 35 U.S.C 103(a) as being unpatentable over Fan et al. U.S. Application 2004/0104544 in view of De Jager U.S. Patent 5,439,627. In particular, Fan is said to teach all elements of claim 1 except that the ceramic seal has a higher porosity and is substantially free of binder after firing. De Jager is said to teach that the porosity of ceramic matrix composites increases as binder is removed by heating. More particularly, it is said that by the teachings of both Fan an De Jager that is to obvious to discover the optimum value of a result effective variable, such as fired porosity between 40% and 50%, by adjusting the aluminum oxidation and binder burn-off.

Applicant respectfully traverses. It is well known that removing a binder from a ceramic matrix by heating increases porosity (see De Jager, column 6, line 20). It is well known that porosity is generally an undesirable quality for a seal. Fan teaches that porosity is to be minimized in order to increase seal effectiveness. De Jager teaches that the cavities and voids left by a binder removed from a ceramic matrix by heat must be filled (see De Jager, column 3, line 55). However, despite the possibility of later filling in the cavities and voids, those skilled in the art have generally avoided the manufacture of seals by the process of removing binder from a ceramic matrix by heating, because of the increased porosity. Therefore, it would not be obvious to one skilled in the art to combine the teachings of Fan and De Jager. That ceramic seals manufactured by removing a binder from a ceramic matrix by heating could produce a tolerable level of porosity, without filling, is an unexpected result.

Therefore, Applicant respectfully submits that claim 1, as amended, and claims 2-10 which depend on claim 1, are not obvious over Fan et al. U.S. Application 2004/0104544 in view of De Jager U.S. Patent 5,439,627.

CONCLUSION

Applicant respectfully submits that claims 1-10 are now in condition for allowance, and allowance is respectfully requested.

Respectfully submitted,
Robert Brule, et al.

By _____
Edward Yoo
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